IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Sydney M. Pugh et al.		
Title:	AN ARTIFICIAL STABILIZED COMPOSITION OF CALCIUM PHOSPHATE PHASES PARTICULARLY ADAPTED FOR SUPPORTING BONE CELL ACTIVITY		
App. No.:	09/029,872	Filed:	June 29, 1998
Examiner:	Paul B. Prebilic	Group Art Unit:	3774
Atty. Dkt. No.:	7077-P30033	Confirmation No.:	6664

MAIL STOP APPEAL BRIEF - PATENTS
THE BOARD OF PATENT APPEAL AND INTERFERENCES
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

REMARKS IN SUPPORT OF THE PRE-APPEAL BRIEF REQUEST FOR REVIEW

Dear Commissioner:

In reply to the Final Office Action mailed August 7, 2009, Applicants are concurrently filing herewith a Notice of Appeal and a Pre-Appeal Brief Request for Review. Applicants concisely present in the Remarks section reasons why allowance of the claims is proper. Although particular claims are addressed below, Applicants reserve the right to address other claims at a later time (e.g., in the Appeal Brief).

Request for at least three examiners on the panel

In order to facilitate full consideration of the remarks filed herewith, the Applicants respectfully request that the Art Unit Supervisor designate a panel composed of at least three examiners, two of which have not personally worked on this application before the current appeal.

Applicants have clearly met the burden of the limitation for "consisting essentially of"

With regard to claim 1, Applicants have used the transitional phrase "consisting essentially of," which limits the scope of a claim to only those the specific materials or steps that do not materially affect the basic and novel characteristics of the claimed invention, herein bioactivity. The PTO has cited MPEP 2111.03, which is instructive on issues relating to

interpretation of "consisting essentially of" language. That section makes it clear that Applicants have the burden to establish the identity of basic and novel characteristics; otherwise "consisting essentially of" shall be construed by the PTO to be "comprising." In particular, Applicants are to provide a clear indication in the specification or claims of what the basic and novel characteristics actually are and are to show that the introduction of additional components would materially change the characteristics of Applicant's invention.

Applicants have met this burden by (i) clearly indicating and defining the basic and novel characteristics in the specification, (ii) expressly reciting in the claims one of the basic and novel characteristics (i.e., the composition is bioactive), and (ii) providing impartial third party evidence that high silicon content, which Ruys clearly states leads to a predominant glass phase, hinders bioactivity (i.e., see Best et al., pg. 986). See also page 10 of the Response dated September 25, 2008, which discusses that the predominant phase of Si-P-O glass is clearly disclosed by Ruys.

In the specification, Applicants clearly indicate what is considered to be a basic and novel characteristic of the invention by stating that it "has now been found that the presence of stabilizing entities significantly and unexpectantly stabilized the α-TCP within the calcium phosphate phases to provide a bioactive composition which supports and encourages the activity of both osteoblasts and osteoclasts." (Specification, p. 9, l. 28 – p. 10, l. 12). In addition, Applicants provided a definition of bioactive, which includes controlled extracellular resorption of the composition by osteoclasts. (Specification, p. 10, ll. 10-15). Applicants further discuss how such resorption is controlled by the ratios of α-tricalcium phosphate to hydroxyapatite. (Specification, p. 10, l. 28 – p. 11, l. 3). As such, the specification provides a clear indication of the basic and novel characteristic, bioactivity. In addition, Applicants further claimed the bioactivity in both independent claims 1 and 55, going over and above the minimum burden placed on Applicants to indicate the basic and novel characteristic.

In response to Applicants' previous remarks, the PTO acknowledged Applicants' assertion that "consisting essentially of" precludes Si-P-O glass, which is present in Ruys. See page 7 of the Office Action dated June 25, 2008. However, the PTO concluded that "consisting essentially of" does not preclude other calcium phosphate phases or other contaminants. In fact, the language "consisting essentially of" precludes any component that would materially affect the basic and novel characteristic of the composition. See MPEP 2111.03. Further, the

statement in the specification at page 12 that the contaminant "preferably does not affect the composition and morphology of the stabilized composition in any manner which will affect the support of bone cell activity thereon," referenced by the PTO, further emphasizes the Applicants' point that various contaminants, including Si-P-O glass and other contaminants, have an adverse influence on bone cell activity, i.e. the relied upon basic and novel characteristic. Given its proper weight, the statement that the contaminant "preferably does not affect the composition and morphology of the stabilized composition in any manner which will affect the support of bone cell activity thereon," provides a clear nexus between the composition and the basic and novel characteristic, bioactivity, as required for the interpretation of the "consisting essentially of" transitional phrase. Furthermore, Applicants provided an impartial third party reference that clearly states that high levels of silicon inhibit osteoclast activity. (See Best et al. pg. 986).

Accordingly, Applicants have provided a clear indication of the basic and novel characteristics, not only in the specification, but also in the claims. Further, Applications have provided evidence that introduction of additional components would materially change the characteristics of the invention.

Turning to the cited reference, the Ruys material does not *consist essentially of* a bioactive, high α-TCP content material since the high α-TCP-content materials of Ruys contain notable Si-P-O glass, significantly compromising the bioactivity of the material in terms of osteoclast activity. As seen in the Declaration by Dr. Smith dated November 2, 2007, Applicants have found that external Si-containing phases, such as Si-P-O glass, in amounts greater than 20 wt% compromise bioactivity as claimed, that is, "to support osteoblastic bone growth and to support extracellular resorption of said composition by osteoclasts."

In contrast to Ruys, Applicants have discovered a method for producing bone replacement compositions predominantly formed of stabilized calcium phosphate phases without the formation of a significant amount of silicon compounds outside of the calcium phosphate matrices. As clearly seen in the Declaration, the method is significantly different from the method disclosed in Ruys, and the material produced by such a method is different from the material disclosed by Ruys. In particular, the compositions produced by the methods discovered by Applicants are predominantly calcium phosphate compositions and have less than 5 wt% of phases including silicon compounds other than silicon stabilized calcium phosphate compositions, such as less than about 3 wt% silicon compound phases. As further explained in

the Declaration, the absence of a significant amount of silicon compositions other than the silicon stabilized calcium phosphate compounds in the presence of stabilized α-TCP permits bioactivity and, in particular, permits balanced osteoblast and osteoclast activity as claimed. Accordingly, the claims are not anticipated nor made obvious by Ruys.

Ruys teaches away from the ratio of alpha tricalcium phosphate and hydroxyapatite

Turning to independent claims 50, 55, and 60, they recite a composition comprising alpha tricalcium phosphate and hydroxyapatite in a ratio of at least 666:333 alpha tricalcium phosphate to hydroxyapatite. Ruys is clearly limited to, at best, TCP content "slightly greater" than the HAp content. A ratio of 666:333 is clearly greater than any ratio fairly derived from the teachings of Ruys.

With respect to Ruys, the PTO asserts that since low dopant levels are only preferred and the concept of high dopant levels is also disclosed, it would have been obvious to make higher dopant materials that would fall within the claimed range. However, Ruys consistently throughout the reference teaches against the formation of materials with high TCP content. For example, on page 71, Ruys states that particular mole ratios should be used "in order to avoid formation of biodegradable TCP (emphasis added)." On page 74 in the last paragraph, Ruys teaches use of stir/boil methods "in order to eliminate TCP from the calcined product (emphasis added)." Further, Ruys teaches on page 77, second paragraph that "TCP is an undesirable phase ... (emphasis added)." Clearly, Ruys teaches away from the formation of materials that include TCP. As such, one skilled in the bone replacement arts would have been deterred from forming compositions having at least 666:333 stabilized tricalcium phosphate to hydroxyapatite and thus, would not have been motivated to form such a composition. See MPEP 2143.01.

Ruys is not enabled

The Declaration submitted by Dr. Smith states that after a faithful attempt to reproduce the method of Ruys described on page 74, the material was not reproducible. Specifically, Applicants were unable to produce hydroxyapatite material free of tricalcium phosphate phases using the method disclosed by Ruys. Since this material was a starting material used in forming the rest of the materials of Ruys, the inability to produce such a material would lead to errors if the remaining steps were performed. As such, steps or parameters key to the formation of the samples of Ruys may not have been disclosed in the reference, meaning Ruys is not enabled. See pages 12 and 13 of the Response dated April 15, 2008. Since Ruys is not enabled, it does

not anticipate the claimed invention. See MPEP 2121.02. Further, it cannot be ascertained that there is any reasonable expectation of success if Ruys were modified. See MPEP 2143.02. Accordingly, the claims are not *prima facie* obvious.

There is no motivation to combine Davies with Ruys

Davies clearly does not teach any compositions that take the form of powders, granules, or bulk materials. See Examiner's Admission in the Final Office Action dated August 7, 2009. The Declaration submitted by Dr. Smith clearly demonstrates that Ruys is not enabled. Additionally, it is clear that Ruys teaches away from the claims that recite a composition comprising alpha tricalcium phosphate and hydroxyapatite in a ratio of at least 666:333 alpha tricalcium phosphate to hydroxyapatite. Since Ruys is not enabled as well as teaches away from claims 50, 55, and 60, there is no reasonable expectation of success to support the combination of Davies with Ruys. See MPEP 2143.02. Accordingly, there is no motivation to combine Davies with Ruys.

Conclusion

For at least the arguments give above, Applicants respectfully submit that claims 1, 55, and 60 and their dependent claims are allowable. Applicants respectfully request the withdrawal of the final rejection and the allowance of all claims in the Present Application without the need for a long and costly appeal.

The Commissioner is hereby authorized to charge any fees that may be required, or credit any overpayment, to Deposit Account Number 50-3797.

Respectfully submitted,

11/7/09
Date

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PRE-APPEAL BRIEF REQUEST FOR REVIEW

Docket Number (Optional)
7077-P30033

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on _____

Signature _____

Typed or printed name _____

Application Number	Filed
09/029,872	*June 29, 1998*

First Named Inventor
Sydney M. Pugh

Art Unit	Examiner
3774	*Paul B. Prebilic*

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).
Note: No more than five (5) pages may be provided.

I am the

- ☐ applicant/inventor.
- ☐ assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)
- ☑ attorney or agent of record. Registration number *36,079*
- ☐ attorney or agent acting under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34 _____

Signature
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Typed or printed name

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October 7, 2009
Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☐ *Total of _____ forms are submitted.